REMARKS/ARGUMENTS

Claims 1-40 are pending in the present application.

This Amendment is in response to the Final Office Action mailed August 18, 2009 to support a Request for Continued Examination (RCE) filed concurrently. In the Final Office Action, the Examiner rejected claims 23-33 under 35 U.S.C. §101; and claims 1-40 under 35 U.S.C. §103(a). Applicant has amended the specification, and claims 1, 4, 6, 9-12, 15, 17, 20-23, 25, 26, 28, 31-34, 36, 37, 39, and 40. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Rejection Under 35 U.S.C. § 101

In the Final Office Action, the Examiner rejected claims 23-33 under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Applicant respectfully disagrees with the Examiner's characterization of the claims as argued in the previous response. However, in the interest of expedite prosecution of the application, Applicant has amended claim 23 and the specification according to the Examiner's suggestion.

Accordingly, Applicant respectfully requests the rejection of claims 23-33 be withdrawn.

Rejection Under 35 U.S.C. § 103(a)

In the Office Action, the Examiner rejected claims 1-40 under 35 U.S.C. §103(a) as being unpatentable by U.S. Patent No. 7,103,669B2 issued to Apostolopoulos ("Apostolopoulos") in view of U.S. Publication No. 2006/0146934 issued to Caglar et al. ("Caglar"). Applicant respectfully traverses the rejection and submits that the Examiner has not met the burden of establishing a prima facie case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *MPEP §2143, p. 2100-126 to 2100-130 (8th Ed., Rev. 5, August 2006).* Applicant

respectfully submits that there is no suggestion or motivation to combine their teachings, and thus no *prima facie* case of obviousness has been established.

Furthermore, the Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), stated: "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined." MPEP 2141. In *KSR International Co. vs. Teleflex, Inc.*, 127 S.Ct. 1727 (2007) (Kennedy, J.), the Court explained that "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." The Court further required that an explicit analysis for this reason must be made. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR 127 S.Ct.* at 1741, quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). In the instant case, Applicant respectfully submits that there are significant differences between the cited references and the claimed invention and there is no apparent reason to combine the known elements in the manner as claimed, and thus no *prima facie* case of obviousness has been established.

Apostolopoulos discloses a video communication method and system employing multiple state encoding and path diversity. A system is composed of two jointly designed subsystems: (1) multiple state video coding system and (2) path diversity transmission system (Apostolopoulos, col. 3, lines 52-54). A multiple state video encoder 114 for generating at least two independently decodable packet streams in response to an original video stream and a path selector 118 for explicitly sending each packet stream over a different path through the network 130 (Apostolopoulos, col. 5, lines 45-49; Fig. 1). The multiple state video encoder 114 receives original video 115 and encodes the video 115 in this example into three independently decodable packet streams 116 by employing multiple state encoding with three states (Apostolopoulos, col. 5, lines 50-52; Fig. 1). The multiple state video encoder may be replaced by a multiple

description video coder. Specifically, a multiple description video coder is a coder, which codes the original video into a number of streams, where each stream is independently decodable from the other streams (Apostolopoulos, col. 9, lines 40-44; Fig. 3). A state recovery block 526 selects past and future frames to be used in recovering a lost frame while taking into account scene changes (Apostolopoulos, col. 11, line 66 – col. 12, line 2; Fig. 6). A receiver 120 includes a packet receiver 124 for combining the multiple streams into a single stream and a video decoder 128 for reconstructing the original video frame in response to received encoded video frames (Apostolopoulos, col. 6, lines 17-20; Fig. 1). The receiver 332 includes a decode block 320 that generates a series of reconstructed even video frames 360 in response to the encoded even frames 356. The receiver also includes a decode block 322 that generates a series of reconstructed odd video frames 362 in response to the encoded odd frames 354 (Apostolopoulos, col. 8, lines 40-45; Fig. 3). The receiver 332 includes a merge block 324 that combines the reconstructed even and odd video frames 360 and 362 into a series of reconstructed video frames 344 in the proper frame order (Apostolopoulos, col. 9, lines 22-26; Fig. 3).

Caglar discloses video coding. A finer quantizer is used to encode a different picture in an enhancement layer (Caglar, paragraph [0035], lines 5-6). There can be multiple enhancement layers, each increasing picture resolution over that of the previous layer (Caglar, paragraph [0036], lines 18-20).

Apostolopoulos and Caglar, taken alone or in any combination, do not disclose or render obvious, at least one of: (1) a receiver to receive a receiving stream formed by a default stream and N restart sub-streams from a transmitter over a transmission path, N being an integer equal to at least 1 and selected according to a selection, the default stream being coded by a multiple description (MD) coding, the N restart sub-streams being coded by a predictive coding and sampled according to a sampling pattern, the default stream and the N restart sub-streams corresponding to a media content, at least one of the N restart sub-streams restarting the media content when there is a restart condition; and (2) a selector coupled to the receiver to select a receiving frame in the receiving stream from the default stream and one of the N restart sub-streams according to a loss status in the default stream; or (3) a transmitter to transmit a default stream and N restart sub-streams to a plurality of receivers over a plurality of transmission paths, N being an integer equal to at least 1 and selected according to a selection at the receivers, the

default stream being coded by a multiple description (MD) coding, the N restart sub-streams being coded by a predictive coding and sampled according to a sampling pattern, the default stream and the N restart sub-streams corresponding to a media content, at least one of the N restart sub-streams restarting the media content when there is a restart condition.

First, Apostolopoulos merely discloses a packet receiver 120 for combining the multiple streams into a single stream (Apostolopoulos, col. 6, lines 17-18; Fig. 1), NOT a a receiver to receive a receiving stream formed by a default stream and N restart sub-streams from a transmitter over a transmission path. The receiver decodes the first sub-stream and the second sub-stream separately (Apostolopoulos, col. 6, lines 45-49; Fig. 2, steps 280 and 290). There are packet streams going through several paths carrying several streams 162, 164, and 166 (Apostolopoulos, col. 5, lines 57-65). The receiver receives multiple streams, not a single stream. As shown in Figure 1, the packet receiver 124 receives three packet streams 162, 164, and 166. The combining of the multiple streams takes place after the receiving. In contrast, the claimed invention provides for a receiver to receive a receiving stream from a transmitter over a transmission path. To clarify this aspect of the invention, claims 1, 4, 6, 9-12, 15, 17, 20-23, 25, 26, 28, 31-34, 36, 37, 39, and 40 have been amended.

Second, Apostolopoulos merely discloses multiple decoder blocks 320 and 322 that generate a series of reconstructed even and odd video frames 360 and 362 (Apostolopoulos, col. 8, lines 40-45; Fig. 3), NOT a selector to select a receiving frame in the receiving stream from the default stream and one of the N restart sub-streams. The decoders 320 and 322 decode the even and odd video frames separately and then merge or combines the reconstructed even and odd frames (Apostolopoulos, col. 9, lines 22-34; Fig. 3). The video frames 115 are separated into even video frames 2, 4, 6, 8,... and odd video frames 1, 3, 5, 7,... (Apostolopoulos, col. 7, lines 42-49). The even and odd frames do not correspond to the default stream and N restart sub-streams. They merely refer to alternating frames in a sequence. Furthermore, since the decoders 320 and 322 decode corresponding video frames separately, they do not select a receiving frame from the default stream or the one of the N restart sub-streams.

Third, Apostolopoulos merely discloses when an error has been detected, state recovery is performed by employing previous or future frames of correctly decoded frames (Apostolopoulos, col. 7, lines 19-21; Fig. 9), NOT a selector to select from the default stream

and one of the N restart sub-streams according to a loss status in the default stream. Using previous or future frames of correctly decoded frames is not the same as selecting a receiving frame from the default stream and one of the N re-start sub-streams. In addition, detecting an error merely determines if there is an error in the decoded frame (Apostolopoulos, col. 7, lines 13-14; Fig. 9). It is not equivalent to a loss status in the default stream.

Fourth, Apostolopoulos merely discloses a multiple state video encoder 114 that includes a frame separate block 312 that separates the original video frames 115 into, for example, a series of odd video frames 350 and a series of even video frames 352 (Apostolopoulos, col. 7, lines 40-44; Fig. 3), NOT a transmitter to transmit a default stream and N restart sub-streams to a plurality of receivers over a plurality of transmission paths, N being an integer equal to at least 1 and selected according to a selection at the receivers, the default stream being coded by a multiple description (MD) coding, the N restart sub-streams being coded by a predictive coding and sampled according to a sampling pattern, the default stream and the N restart sub-streams corresponding to a media content, at least one of the N restart sub-streams restarting the media content when there is a restart condition. As discussed above, even and odd frames merely refer to alternating frames in a sequence (Apostolopoulos, col. 7, lines 42-49). They do not correspond to a default stream and N restart sub-streams. Furthermore, separating video frames into odd and even frames is not the same as multiple description (MD) coding. Odd and even frames refer to the same original frames. They are not coded with multiple descriptions. Moreover, Apostolopoulos merely discloses encoding the video 115 into at least two independently decodable packet streams (Apostolopoulos, col. 5, lines 45-47), not a default stream and N restart sub-streams. The at least two independently decodable packet streams merely correspond to the video 115. They do not provide restart of the content stream when there is a restart condition.

In the Final Office Action, the Examiner cites col. 7, lines 9-37 (Final Office Action, page 5, paragraph 8). However, the cited excerpt does not provide the necessary support. For ease of reference, the cited excerpt is copied below.

> "FIG. 9 a flowchart illustrating the steps performed by multiple state decoder in accordance with one embodiment of the present invention. In step 910, a determination is made whether the received frame is from a first sub-sequence. If so, the packet is

> decoded in step 914. In step 918, a determination is made whether an error has been detected. If there is no error, the frame is reconstructed (step 920) and merged with other frames (step 930). For example, the decoded odd frames can be merged with the decoded even frames.
>
> **When an error has been detected, state recovery is performed by employing previous or future frames of correctly decoded frames** (step 950). In step 960, the lost frame is estimated. Processing then proceeds to step 930. Optionally, when an error has been detected, steps 940 and 944 may be processed before the state recovery 950. In step 940, a determination is made whether a reduced frame rate is acceptable (e.g., recovering the video stream at one-half the frame rate). If so, in step 944, the video is displayed at the reduced frame rate by using frames from on of the other sub-sequences (e.g., the second sub-sequence)." (Apostolopoulos, col. 7, lines 9-37. Emphasis added.)

As seen from the above excerpt, Apostolopoulos merely discloses when an error has been detected, state recovery is performed by employing previous or future frames of correctly decoded frames (Apostolopoulos, col. 7, lines 19-21). Employing the previous or future frames of correctly decoded frames is not the same as selecting a receiving frame from the default stream and one of the N restart sub-streams according to a loss status in the default stream. Furthermore, reducing the frame rate has nothing to do with selecting a frame.

The Examiner agrees that Apostolopoulos does not explicitly teach a default stream and N sub-streams (Final Office Action, page 5, paragraph 8). Accordingly, Apostolopoulos cannot disclose selecting a receiving frame from the default stream and one of the N restart sub-streams.

Furthermore, Caglar merely discloses multiple enhancement layers, each increasing picture resolution over that of the previous layer (Caglar, paragraph [0036], lines 18-20), not default stream and N restart sub-streams, as recited in claims 1, 12, 21, 23, 32, 34, and 39, or a layered representation of the frames according to an encoding rate, as recited in claims 9, 11, 20, 22, 31, 33, and 40. The multiple enhancement layers merely have increasing resolutions. They are not default stream and N restart sub-streams or layered representation according to an encoding rate. As recited in the rejected claims, the default stream is coded by a multiple description (MD) coding, and the N restart sub-streams are coded by a predictive coding and sampled according to a sampling pattern. The Examiner has not shown that the multiple

enhancement layers disclosed by Caglar are coded by an MD coding or a predictive coding and sampled according to a sampling pattern. Moreover, the Examiner has not shown that the multiple enhancement layers disclosed by Caglar include at least one of the N restart sub-streams restarting the media content when there is a restart condition.

The Examiner cites several paragraphs in to support the Examiner's arguments. However, none of these excerpts provides the support. For ease of reference, the cited excerpts are copied below.

> "Spatial scalability allows for the creation of multi-resolution bit-streams to meet varying display requirements/constraints. A spatially scalable structure is shown in FIG. 5. It is similar to that used in SNR scalability. In spatial scalability, **a spatial enhancement layer is used to recover the coding loss between an up-sampled version of the reconstructed layer used as a reference by the enhancement layer, that is the reference layer, and a higher resolution version of the original picture**. . . . Apart from the up-sampling process from the reference to the enhancement layer, the processing and syntax of a spatially scaled picture are identical to those of an SNR scaled picture. Spatial scalability provides increased spatial resolution over SNR scalability." (Caglar, paragraph [0036]. *Emphasis added.*)

> "An example of prediction relationships in fine granularity scalable coding is shown in FIG. 6. In a fine granularity scalable video coding scheme, the base-layer video is transmitted in a well-controlled channel (e.g. one with a high degree of error protection) to minimise error or packet-loss, in such a way that the base layer is encoded to fit into the minimum channel bandwidth. This minimum is the lowest bandwidth that may occur or may be encountered during operation. **All enhancement layers in the prediction frames are coded based on the base layer in the reference frames.** Thus, errors in the enhancement layer of one frame do not cause a drifting problem in the enhancement layers of subsequently predicted frames and the coding scheme can adapt to channel conditions." (Caglar, paragraph [0041]. *Emphasis added.*)

> "In FIG. 8, **frame 2 is predicted from the even layers of frame 1** (that is the base layer and the 2nd layer). Frame 3 is predicted from the odd layers of frame 2 (that is the 1st and the 3rd layer). in turn, frame 4 is predicted from the even layers of frame 3. This odd/even prediction pattern continues. The term group depth is used to describe the number of layers that refer back to a common reference layer." (Caglar, paragraph [0043]. *Emphasis added.*)

> "FIG. 8 exemplifies a case where the group depth is 2. The group depth can be changed. **If the depth is 1, the situation is essentially equivalent to the traditional scalability scheme shown in FIG. 7. If the depth is equal to the total number of layers, the scheme becomes equivalent to the FGS method illustrated in FIG. 6**. Thus, the progressive FGS coding scheme illustrated in FIG. 8 offers a compromise that provides the advantages of both the previous techniques, such as high coding efficiency and error recovery." (Caglar, paragraph [0044]. *Emphasis added.*)
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> "PFGS provides advantages when applied to video transmission over the Internet or over wireless channels. . . . By the time frame 4 is transmitted, the available bandwidth has further increased, **providing sufficient capacity for the transmission of the base layer and all enhancement layers again**. These operations do not require any re-encoding and re-transmission of the video bit-stream. All layers of each frame of the video sequence are efficiently coded and embedded in a single bit-stream." (Caglar, paragraph [0045]. *Emphasis added.*)
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> "Scalable multi-media is typically-ordered into hierarchical layers of data. **A base layer contains an individual representation of a multi-media data, such as a video sequence and enhancement layers contain refinement data which can be used in addition to the base layer**." (Caglar, paragraph [0028]. *Emphasis added.*)
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> "**Complete frames may be base layers** of a scalable frame structure." (Caglar, paragraph [0125]. *Emphasis added.*)
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> ". . .In other words, **an encoder can use the bit-stream of previous frames flexibly and frames can be divided into different combinations of codewords even after they are transmitted**. Information indicating which codewords belong to the high priority information for a particular frame can be transmitted when a virtual prediction frame is generated. In the prior art, a video encoder chooses the layering division of a frame while encoding the frame and the information is transmitted within the bit-stream of the corresponding frame." (Caglar, paragraph [0271]. *Emphasis added.*)

As seen from the above excerpts, Caglar merely discloses: (1) a spatial enhancement layer is used to recover the coding loss between an up-sampled version of the reconstructed layer used as a reference by the enhancement layer, that is the reference layer, and a higher resolution

version of the original picture (Caglar, paragraph [0036]); (2) all enhancement layers in the prediction frames are coded based on the base layer in the reference frames (Caglar, paragraph [0041]); (3) frames are predicted from even and odd layers (Caglar, paragraph [0043]); (4) A base layer contains an individual representation of a multi-media data, such as a video sequence and enhancement layers contain refinement data which can be used in addition to the base layer (Caglar, paragraph [0028]); and (5) an encoder can use the bit-stream of previous frames flexibly and frames can be divided into different combinations of codewords even after they are transmitted (Caglar, paragraph [0271]). A spatial enhancement layer is used to recover the coding loss between an up-sampled version of the reconstructed layer and a higher resolution version of the original picture. Since it is used merely to recover the coding loss between two versions, it is not a default stream, nor a re-start sub-stream.

The Examiner failed to establish a prima facie case of obviousness and failed to show there is teaching, suggestion, or motivation to combine the references. When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to: (A) The claimed invention must be considered as a whole; (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) Reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Col, Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). "When determining the patentability of a claimed invention which combined two known elements, 'the question is whether there is something in the prior art as a whole suggest the desirability, and thus the obviousness, of making the combination.'" *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992), 24 USPQ2d 1040; *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ (BNA) 481, 488 (Fed. Cir. 1984). To defeat patentability based on obviousness, the suggestion to make the new product having the claimed characteristics must come from the prior art, not from the hindsight knowledge of the invention. *Interconnect Planning Corp. v. Feil*, 744 F.2d 1132, 1143, 227 USPQ (BNA) 543, 551 (Fed. Cir. 1985). To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the Examiner to show a motivation to combine the references that create the case of obviousness. In other words, the Examiner must show

reasons that a skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the prior elements from the cited prior references for combination in the manner claimed. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1996), 47 USPQ 2d (BNA) 1453. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or implicitly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973. (Bd.Pat.App.&Inter. 1985). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Furthermore, although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *In re Mills*, 916 F.2d at 682, 16 USPQ2d at 1432; *In re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992), 23 USPQ2d 1780.

Moreover, the Examiner failed to establish the factual inquires in the three-pronged test as required by the *Graham* factual inquires. There are significant differences between the cited references and the claimed invention as discussed above. Furthermore, the Examiner has not made an explicit analysis on the apparent reason to combine the known elements in the fashion in the claimed invention. Accordingly, there is no apparent reason to combine the teachings of Apostolopoulos and Caglar.

In the present invention, the cited references do not expressly or implicitly disclose any of the above elements. In addition, the Examiner failed to present a convincing line of reasoning as to why a combination of Apostolopoulos and Caglar is an obvious application of error recovery for multicast of multiple description coded video using restart, or an explicit analysis on the apparent reason to combine Apostolopoulos and Caglar in the manner as claimed.

Therefore, Applicant believes that independent claims 1, 10, 12, 21, 23, 32, 34, and 39 and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicant respectfully requests the rejection under 35 U.S.C. §103(a) be withdrawn.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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